

PATENT COOPERATION TREATY
PCT
INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY
(Chapter II of the Patent Cooperation Treaty)
(PCT Article 36 and Rule 70)

Applicant's or agent's file reference Case 2266PCT/VR	FOR FURTHER ACTION	
See Form PCT/IPEA/416		
International application No. PCT/EP2004/051108	International filing date (<i>day/month/year</i>) 14.06.2004	Priority date (<i>day/month/year</i>) 18.06.2003
International Patent Classification (IPC) or national classification and IPC G04G1/00, H01Q1/27		
Applicant ASULAB S.A.		
<p>1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.</p> <p>2. This REPORT consists of a total of 6 sheets, including this cover sheet.</p> <p>3. This report is also accompanied by ANNEXES, comprising:</p> <p>a. <input checked="" type="checkbox"/> (<i>sent to the applicant and to the International Bureau</i>) a total of 2 sheets, as follows:</p> <ul style="list-style-type: none"> <input checked="" type="checkbox"/> sheets of the description, claims and/or drawings which have been amended and are the basis of this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions). <input type="checkbox"/> sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box. <p>b. <input type="checkbox"/> (<i>sent to the International Bureau only</i>) a total of, (indicate type and number of electronic carrier(s)), containing a sequence listing and/or tables related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).</p>		
<p>4. This report contains indications relating to the following items:</p> <ul style="list-style-type: none"> <input checked="" type="checkbox"/> Box No. I Basis of the opinion <input type="checkbox"/> Box No. II Priority <input type="checkbox"/> Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability <input type="checkbox"/> Box No. IV Lack of unity of invention <input checked="" type="checkbox"/> Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement <input type="checkbox"/> Box No. VI Certain documents cited <input type="checkbox"/> Box No. VII Certain defects in the international application <input type="checkbox"/> Box No. VIII Certain observations on the international application 		
Date of submission of the demand 09.03.2005	Date of completion of this report 19.08.2005	
Name and mailing address of the international preliminary examining authority:  European Patent Office - P.B. 5818 Patentlaan 2 NL-2280 HV Rijswijk - Pays Bas Tel. +31 70 340 - 2040 Tx: 31 651 epo nl Fax: +31 70 340 - 3016	Authorized Officer Pirozzi, G Telephone No. +31 70 340-4878	

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International application No.
PCT/EP2004/051108

15/00 RECEIVED BY THE 14 JUNE 2005

Box No. I Basis of the report

1. With regard to the **language**, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.
 - This report is based on translations from the original language into the following language, which is the language of a translation furnished for the purposes of:
 - international search (under Rules 12.3 and 23.1(b))
 - publication of the international application (under Rule 12.4)
 - international preliminary examination (under Rules 55.2 and/or 55.3)
2. With regard to the **elements*** of the international application, this report is based on (*replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report*):

Description, Pages

1-9 as originally filed

Claims, Numbers

1-11 filed with telefax on 21.06.2005

Drawings, Sheets

1/4-4/4 as originally filed

- a sequence listing and/or any related table(s) - see Supplemental Box Relating to Sequence Listing

3. The amendments have resulted in the cancellation of:
 - the description, pages
 - the claims, Nos.
 - the drawings, sheets/figs
 - the sequence listing (*specify*):
 - any table(s) related to sequence listing (*specify*):

4. This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).
 - the description, pages
 - the claims, Nos.
 - the drawings, sheets/figs
 - the sequence listing (*specify*):
 - any table(s) related to sequence listing (*specify*):

* If item 4 applies, some or all of these sheets may be marked "superseded."

**INTERNATIONAL PRELIMINARY REPORT
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International application No.
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Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes:	Claims	1-11
	No:	Claims	
Inventive step (IS)	Yes:	Claims	1-11
	No:	Claims	
Industrial applicability (IA)	Yes:	Claims	1-11
	No:	Claims	

2. Citations and explanations (Rule 70.7):

see separate sheet

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JC20 Receipt date 31 OCT 2005

Re Item V

Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

Reference is made to the following documents:

D2: US-B1-6 266 019 (HICKLE RANDY D ET AL) 24 July 2001 (2001-07-24)

D3: US-A-4 673 936 (KOTOH KEIGO) 16 June 1987 (1987-06-16)

1 Independent claim 1 - Novelty

- 1.1 The document D3 is regarded as being the closest prior art to the subject-matter of amended claim 1, and shows a wristwatch including:
 - a) a case which is metallised in its internal side (col. 4, lines 48-50);
 - b) an electronic module (fig. 2) including a printed circuit board (element 30) and an electric power source (element 68);
 - c) the wristwatch further including an antenna (element 11) provided with a ground plane (element 32);
 - d) the circuit board having at its periphery a mechanical contact zone with the internal side of the case (the PCB is in contact with the element 56 via the slot 86 of the element 40).
- 1.2 Therefore, document D3 discloses the features of the preamble of the amended claim 1.
- 1.3 The subject-matter of the amended claim 1 differs from this known D3 in that the antenna and the ground plane are both arranged on the top surface of the printed circuit board and in that the printed circuit board includes a conductive path over said mechanical contact zone so as to create a ground connection with the case and extend the ground plane in directions extending substantially in the extension of said ground plane, the extension being located substantially in the plane containing the ground plane of the antenna.
- 1.4 A further comment is provided about document D2. Indeed this document discloses a

mobile telephone wherein a printed circuit board bears an antenna, a ground plane and a perimetrical track which connects the ground plane of the antenna with the rear case. This part of the case is metallised. The novelty of the present claim 1 with respect to this document is ensured by the fact that D2 refers to a mobile telephone and by the particular arrangement of the antenna on the printed circuit board.

- 1.5 The subject-matter of the amended claim 1 is therefore new (Article 33(2) PCT).

2 Independent claim 1 - Inventive step

- 2.1 The problem to be solved by the features of paragraph 1.3 above may be regarded as: how to simplify the design, the mounting and the assembly of the wristwatch of D3, while at the same time achieving also a better quality in the reception of the electromagnetic information.
- 2.2 D3 does not teach to use the mechanical connection with the case of the wristwatch also as an electrical connection in such a way to extend the dimensions of the ground plane of the printed circuit board. Indeed, in D3, the grounding is implemented via soldering. Therefore the skilled man would not simply implement the solution of claim 1 without applying his inventive skills.
- 2.3 Furthermore, because document D2 discloses a ground connection between the ground plane of the antenna and the metallised rear case, the skilled man could, in principle, combine the teachings of D2 and D3.

However, the skilled man would not perform this combination without an inventive step because the teaching of D2 is applied to a mobile telephone, while the claimed subject-matter refers specifically to a wristwatch and to the specific problems encountered when designing such a device.

Indeed, even if a mobile telephone is suitable to be worn on a wrist, it is in use normally held into a hand, with the antenna placed on the rear side and facing outwards, whereas, the claimed wristwatch requires that the antenna is mounted in such a way that it would face the outside while being worn on the wrist. Therefore the skilled man would not

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straightforwardly apply the technical solutions for a mobile telephone to the design of a wristwatch.

The above conclusion is also strengthened by the fact that none of the documents D2 or D3 discloses the "enlarging of the ground plane in directions extending in the plane of the ground plane itself", as in claim 1.

- 2.4 It is therefore believed that claim 1 implies an inventive step in the sense of Article 33(3) PCT with respect to the prior art.

3 Dependent claims

Claims 2-11 depend on claim 1, therefore, they satisfy the requirements of Articles 33(1), (2) and (3) PCT.

4 Industrial applicability

The subject-matter of claims 1-11 is industrially applicable.

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CLAIMS

1. Wristwatch including a case (2) at least one part of which is electrically conductive and in which are housed an electronic module (6) including a printed circuit board (60) and an electric power source (10) for powering said electronic module, said wristwatch further including an antenna (20) provided with a ground plane (22), said printed circuit board (60) having, at its periphery, a mechanical contact zone with said electrically conductive part (4) of the case (2).

characterized in that the antenna (20) and the ground plane (22) are arranged on the top face of said printed circuit board (60), said top face being arranged on the side of a display device (5) of the wristwatch, and in that said printed circuit board (60) includes a conductive path (65) extending at the periphery of said printed circuit board, over said mechanical contact zone, and establishing an electric contact, on the one hand, with said electrically conductive part (4) of the case (2) and, on the other hand, with said ground plane (22) so as to enlarge the ground plane of said antenna (20) in directions extending substantially in the extension of said ground plane (22), the enlargement being located substantially in the plane containing the ground plane (22) of the antenna (20).
2. Wristwatch according to claim 1, characterized in that said antenna (20) is a micro-strip antenna including a radiating element (21) arranged substantially parallel to said ground plane (22).
3. Wristwatch according to any of claims 1 or 2, characterized in that it includes an electrically conductive strip (45) made of compressible material that is inserted, on said mechanical contact zone, between said electrically conductive part (4) of the case (2) and said conductive path (65).
4. Wristwatch according to claim 3, characterized in that said electrically conductive strip (45) is compressed between said conductive path (65) and a shoulder (40) arranged on the electrically conductive part (4) of the case (2).
5. Wristwatch according to claim 4, characterized in that it further includes a support element (70, 75) exerting a pressure at several points of the periphery of said printed circuit board (60) where said electrically conductive strip (45) is compressed.
6. Wristwatch according to claim 3, characterized in that said electrically conductive strip (45) is a conductive elastomer.
7. Wristwatch according to claim 1, characterized in that said conductive path (65) is arranged on a first face of the printed circuit board (60) and is electrically connected to other conductive paths of the electronic module (6) via metallised holes (80).

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8. Wristwatch according to claim 1, characterized in that said electrically conductive part (4) of the case (2) is electrically connected to a pole of determined electric potential of the electric power source (10), said electrically conductive part (4) of the case (2) being used to bring said determined electric potential to said electronic module (6) via said conductive path (65).

9. Wristwatch according to claim 1, characterized in that said electrically conductive part (4) of the case (2) is brought to a determined electric potential via said conductive path (65).

10. Wristwatch according to claim 1, characterized in that said conductive path (65) extends over substantially the entire periphery of the printed circuit board (60).

11. Wristwatch according to claim 1, characterized in that said conductive path (65) extends over at least a part of the periphery of the printed circuit board (60) located in proximity to said ground plane (22).